BEHAVIOUR BASED SAFETY CHECKLIST BASED ON BOWEC REQUIREMENTS IN CONSTRUCTION INDUSTRY (LANDED HOUSING)

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I hereby declare that I have checked this thesis and in my opinion, this thesis is adequate in terms of scope and quality for the award of the degree of Bachelor in Occupational Safety and Health (Hons)

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I hereby declare that the work in this thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Malaysia Pahang or any other institutions.

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ABSTRAK

Dalam industri pembinaan (perumahan mendarat), kebanyakan kemalangan dan kecederaan yang hampir-hampir berlaku disebabkan oleh tingkah laku yang tidak selamat oleh majikan dan pekerja di tapak pembinaan (perumahan mendarat). Kekurangan pematuhan pada peraturan juga merupakan salah satu punca kemalangan dan kecederaan yang hampir-hampir berlaku dalam industri pembinaan (perumahan mendarat). Kajian ini bertujuan untuk mengenal pasti keperluan Operasi Bangunan dan Kerja-kerja Binaan Kejuruteraan (BOWEC) dan membangunkan semakan Keselamatan Berasaskan Perilaku (BBS) berdasarkan keperluan BOWEC dalam industri pembinaan (perumahan mendarat). Kajian ini juga bertujuan untuk mengesahkan senarai semak BBS dengan menggunakan kajian kes dalam industri pembinaan (perumahan mendarat). Microsoft Word dan Microsoft Access digunakan dalam kajian ini untuk membangunkan sistem untuk senarai semak BBS. Konsep yang digunakan untuk membangunkan senarai semak BBS adalah "Plan–Do–Check-Act" (PDCA). Senarai semak BBS yang dibangunkan terbahagi kepada dua bahagian, iaitu senarai semak BBS untuk majikan dan pekerja. Lokasi kajian ini adalah di Kuantan, Pahang. Untuk pengumpulan data, senarai semak BBS yang ada dalam sistem digunakan dan data dianalisis dengan menggunakan kaedah peratusan. Kaedah peratusan digunakan untuk mengira peratusan pematuhan terhadap keperluan BOWEC bagi pembinaan perumahan mendarat. Hasilnya adalah, senarai semak BBS majikan dan pekerja yang mematuhi keperluan BOWEC, adalah 82% dan 77%. Ini menunjukkan bahawa lebih daripada separuh syarikat ini memenuhi keperluan BOWEC. Kajian ini menyimpulkan dengan hasil objektifnya. Ini menunjukkan bahawa syarikat yang telah dipilih adalah syarikat yang mematuhi piawaian Akta dan Peraturan.

ABSTRACT

In the construction industry (landed housing), most of accidents and near-miss injury occur due to unsafe behaviour of the employers and employees in construction sites (landed housing). Lack of compliance with regulations is also one of the causes of accidents and near-miss injury occur in the construction industry (landed housing). This paper aims to identify Building Operations and Works of Engineering Construction (BOWEC) requirements and develop Behaviour-Based Safety (BBS) checklist based on BOWEC requirements in construction industry (landed housing). This paper also aims to validate BBS checklist by using case studies in construction industry (landed housing). A Microsoft Word and Microsoft Access are used in study to develop a system for BBS checklist. The concept used to develop BBS checklist is the Plan-Do-Check Act (PDCA). The BBS checklist was developed is divided into two parts, which are BBS checklist for employer and employees. The location of this study is at Kuantan, Pahang. For the data collection, BBS checklist which is in the system is used and the data was analysed by using percentage method. The percentage method is used to calculate the percentage of compliance with BOWEC requirements. The result shown, as of employer's and employee's BBS checklist overall complied with BOWEC requirements, is 82% and 77%. It was shown that more than half complied with BOWEC requirements. This study concludes with the result of the objectives. This shows that the company that have been chosen is the company that complies with the standards of Act and Regulation.

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LIST OF SYMBOLS

%	Percentage
N	Total Number of Questions
C	Number of Complied

LIST OF ABBREVIATIONS

ABC	Antecedents-Behaviour-Consequences
BBS	Behaviour Based Safety
BOWEC	Building Operation and Works of Engineering Construction
DO IT	Define, Observes, Intervene and Test
DOSH	Department of Occupational Safety and Health
FMA	Factory and Machinery Act
OSHA	Occupational Safety and Health Act
PDCA	Plan - Do - Check - Act
SME	Subject Matter Expert

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter covers the background of study, problem statement, research objectives, research questions, scope of study, significance of study, conceptual framework, conceptual definition and conclusion.

1.2 Background of study

In developing countries, construction industry is one of an essential national backbone. There are various types of activities in construction industry and indirectly have a highly complex and hazardous environment that will cause more injuries and fatalities (Skeepers and Mbohwa, 2015). Timofeeva, Ulrikh, & Tsvetkun (2017) states based on the assessment conduct by the International Labor Organization, fatal work injuries occur annually which is approximately 60000 on the construction sites all over the world or it is means every 10 minutes one fatal work injury occur in this sector and about 17% (one out of six accidents) fatal work injuries occurs in this sector. Winge and Albrechtsen, (2018) states one of the highest numbers of fatal injuries in industry sector at Norway is construction industry. Based on DOSH (2018), the construction industry a third place in the ranking of occupational sectors with regards to the accident rate.

The construction industry known as the place that have a high level of hazard and risk to the employees (Hoła and Szóstak, 2014). It is because the employees in construction industry work at high, deal with machinery equipment and external activities (Oostakhan and Talab, 2012). Zhang and Fang (2013) stated that one of the most risky industries worldwide is construction industry. Oostakhan and Talab (2012) also states in industry, the most dangerous part is construction sector. Construction industry is the highest of accident occur compare to other industries of the world economy (Yiu, Sze, &

Chan, 2018). (Jasiulewicz-Kaczmarek, Szwedzka, & Szczuka, (2015) states most of the accidents occur in the workplace are comes from unsafe act of the employer and employees. It is means that the construction industry known as the industry that have a dirty, difficult and dangerous place compared with others industry and the accidents occur in construction industry is cause of the unsafe behaviour of the employer and employees.

In addition, in construction industry, there are consist of three level of construction which are building construction, civil/heavy construction and industrial construction. However, in Malaysia, there are many construction sites which is involving with building construction of landed housing. This is because the number of people in Malaysia becomes increase day by day. The increases of construction in Malaysia, the increases number of accidents among workers in construction sites. Many accidents involves with building construction of landed housing such as falling from height, drowning, struck by support formwork and machine related (Samuel, Adul Hamid, & Saidin Misnan, 2017). Samuel et al., (2017) also states this problem occurs among building construction of landed housing due to lack of or non-compliance with safe work procedure, lack of PPE, no warning sign and equipment failure. Lack of supervision and unsafe act of workers also contribute to increase of accident occur in construction site.

To maintain a safety and health in construction industry, a Behaviour Based Safety is a right tools to change behaviour and attitude of the employer and employees which from unsafe behaviour to safe behaviour that can prevent from accident and injury occur. BBS also act as a tecniques to motivate and improve performance of the employees (Lingard and Rowlinson, 1997). Other than that, Krause et al.'s study (as cited in Zhang and Fang, 2013) found that examined the result proved the number of incidents is decrease in five year of collected injury data from 73 construction companies who implemented BBS. To develop BBS programs, preparation of checklist is one of the part that need to consider (Oostakhan and Talab, 2012). This study was conducted to evaluate Behaviour Based Safety Checklist based on BOWEC requirements.

The important things to ensure a safety and health in construction industry, is the compliance with regulations. For the construction industry, it is must comply with Building Operations and Works of Engineering Construction (BOWEC) Regulations 1986. The BOWEC Regulations 1986 is the regulations that shall apply to building operations and to work of engineering construction (OSHA, 2018). Overall, the aim of

this research is to identify BOWEC requirements in construction industry (landed housing). Furthermore, a BBS checklist based on BOWEC requirements were developed for construction industry (landed housing) and validated the BBS checklist by using case studies in construction industry (landed housing). Nevertheless, the safety and health management is important and must be applied by both managements and employees to prevent in any dangerous hazard as well as to reduce the number of accident rate especially in construction site.

1.3 Problem Statement

Recently, there were high rate of accident and injury occur at the construction industry (landed housing) due to unsafe behaviours of the employees. It is may result to permanent disabilities and even fatalities to the person who involved with accident and injury in their workplace. The company may face with a problem which is financial loss where it increases cost of project compensation for employees and also delay project progress. Meanwhile, employees may also face with loss of job, cost of medical treatment and loss living expenditure. For example, according to DOSH (2018), the accident happened in construction site, Johor on 1 April 2018 which is died being hit by a lorry. This accident happened due to a general workers being runned over by a lorry. He was died at the scene. Based on observation stated, the accident occurred cause did not comply with safe operating procedure and employer fail to provide a safe workplace to their employees. It was shows that this accident occurred because of unsafe behaviours of the employer and employees. We can determine that majority accidents in construction site(landed housing) happened as result of unsafe behaviours.

Nowadays the construction of landed housing in Malaysia becomes increase day by day. It may contribute to increase of accidents occur in construction site (landed housing). In addition, in construction industry, there are requirement to comply with BOWEC regulations to ensure safety and health of the employer and employees in the workplace. Failure to comply with BOWEC regulations requirements can be costly in terms of fines, reputation or personal cost when there is an injury or fatality. Besides, to reduce the accidents due to behaviour of the employees at the workplace, a management need to implement a BBS programmes. In implement the BBS programmes, a checklist was developed by authors that use for observation with consideration of regulations and specifications (Zhang and Fang, 2013). It is means use a BBS checklist to identify the

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